

To: McIlwain, Serena[McIlwain.Serena@epa.gov]
From: Meltzer, Kathy
Sent: Wed 8/12/2015 6:05:45 PM
Subject: When our river turned orange

FYI. Puts things into context. You might want to read if you ever have time.

High Country News

When our river turned orange

Nine things you need to know about the Animas River mine waste spill.

Jonathan Thompson Aug. 9, 2015 Web Exclusive

"The question that is crowding upon Durango thick and fast is one of water. The mill slimes from Silverton are now reaching us."

-- Durango Democrat, 1899

On a scorcher of an August afternoon, a crowd gathered on a bridge over the deep-green waters of the Animas River on the north end of Durango, Colorado. A passerby might have thought they were watching a sporting event, perhaps a kayak race or a flotilla of inebriated, scantily clad inner tubers. Yet the river that afternoon was eerily empty of rowers, paddlers or floaters — unheard of on a day like this — and the mood among the onlookers was sombre. One mingling in the crowd heard certain words repeated: sad, tragic, angry, toxic.

They were here not to cheer anyone on, but to mourn, gathered to watch a catastrophe unfold in slow motion. Soon, the waters below would become milky green, then a Gatorade yellow, before finally settling into a thick and cloudy orangish hue — some compared it to mustard, others Tang. Whatever you called it, it was clearly not right.



The river turned a mustardy-Tang color as the wastewater moved through. This was taken about 24 hours after the spill.

Jonathan Thompson

The mustard-Tang plume was the result of approximately three million gallons of wastewater and sludge that had poured from the dormant Gold King mine into Cement Creek, a tributary of the Animas, some 60 miles upstream on the previous morning. The water had backed up in the mine behind a sort of dam formed when the mine portal's ceiling had collapsed sometime earlier. Workers from the Environmental Protection Agency were hoping to install a pipe to drain the water so that they could eventually plug the mine, keeping the contaminated water inside it and out of the streams. Instead, they ended up accidentally breaching the dam, releasing the water.

While the spill occurred just a few miles above Silverton, the impacts hit Durango the hardest. The Animas River courses through the middle of Durango, provides a portion of

its drinking and irrigation water, and over the last few decades has become the recreational and aesthetic, wild, green heart of the city. The spill essentially stopped the heart's beat. Officials closed the river for public health reasons, shutting down hundreds of recreational boaters and tubers, not to mention the local rafting industry. No one yet knows what will happen to the fish, the birds, the bugs and other wildlife that call the river home.



The Animas River was closed for public safety as the wastewater plume moved through town.

Jonathan Thompson

"I'm very sorry for what happened," said David Ostrander, EPA's emergency response director, at a public meeting in Durango held just hours after the plume reached town. "This is a huge tragedy. We typically respond to emergencies, not cause them."

Really, though, the EPA wasn't the root cause of the emergency. It was, most likely, a disaster waiting to happen and the most visible manifestation of an emergency that's been going on in the Upper Animas River Watershed for decades. Here's nine items to help you understand the big picture:

- **Pollution in the Animas is not new:** The Upper Animas River watershed consists of three main streams, the Animas, Cement Creek and Mineral Creek all of which drain the

Silverton Caldera, the highly mineralized collapsed core of an ancient volcano, and which run together at Silverton. Miners started going after the minerals in the 1870s, and the river's been the victim of their pollution ever since. Mines simply poured their tailings directly into the creeks and rivers until, in the 1930s, downstream farmers got them to stop; the remnants of those releases can still be found under the river bed in Durango and beyond. Then there's acid mine drainage. The portals and shafts blasted into the mountainsides hijack the natural hydrology, pulling water flowing through fractures toward natural springs into the mine tunnels. There, the water reacts with iron disulfide (pyrite) and oxygen to form sulfuric acid. The acidic water dissolves naturally occurring heavy metals such as zinc, lead, cadmium, copper and aluminum. The resulting contaminated water flows out of the mine adit as if from a spring. By 1991, when the last major mine in the watershed shut down, there were some 400 mines in the watershed, many discharging unmitigated discharges into streams. Not a fish could be found for miles downstream from Silverton, and the impacts to aquatic life were felt in Durango, where, when the mines were still running, sensitive fish were unable to reproduce.

- **Superfund has long been on the table, and long been swept off:** As mining waned in the late 1980s, federal and state regulatory agencies started looking at how to clean up the mess. Superfund, which comes with a big pile of cash, seemed like the obvious approach. But locals feared that the stigma would destroy tourism along with any possibility of mining's return. Besides, Superfund can be blunt; the complex Animas situation demanded a more surgical, locally-based approach. So the Animas River Stakeholders Group, a collaboration between concerned citizens and representatives from industry and federal and state agencies, was created in 1994 to address the situation. The approach was successful, at first, but then water quality began deteriorating again. The specter of Superfund returned. Many locals, worried about impacts to property values and tourism, have again resisted. Sunnyside Gold Corp. (see below) has offered millions of dollars to further cleanup efforts -- as long as there's no Superfund designation.



The Gold King Mine (bottom of picture) and Cement Creek. Cement Creek has probably never supported fish, and even before the spill had a pH level of about 3.5, on par with Coca-Cola.

Jonathan Thompson w/ the help of EcoFlight

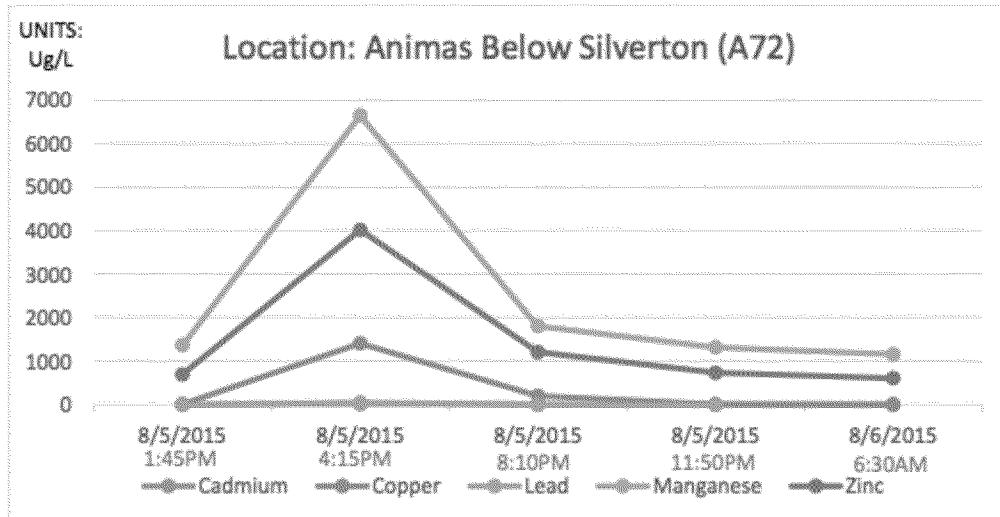
- **The problem is massive and complex, but not hopeless:** In 1991, the last big mine in the region, the Sunnyside, shut down. Its owner, Sunnyside Gold Corp., planned to plug the American Tunnel, thus stanching the flow of acid mine drainage (which it ran through a water treatment plant), and then walk away. The state wouldn't allow it: While a plug, or bulkhead, would be a short-term fix, in the long-term the water, and its contaminants, might back up in the mine and find another way to the surface. So Sunnyside agreed not only to bulkhead its mine, but also to clean up abandoned mines nearby -- a sort of pollution offset project -- while continuing to run the waters of upper Cement Creek through a water treatment facility. That, combined with the ARSG's extensive efforts, worked: By the early 2000s, zinc, cadmium and lead levels in Mineral Creek had dropped by 50 to 75 percent, and water quality in the Upper Animas had improved significantly (Cement Creek had never supported fish, and never will). Fish appeared just below Silverton, where they hadn't been seen in probably a century. It was success, without Superfund.
- **Then it got even more complex:** Sunnyside cut a deal with the state and Gold King mining, a small operation owned by a Silvertonian. Sunnyside would leave, and turn over its water treatment operations to Gold King, along with enough cash to keep it running for a while. Gold King hoped to eventually resume mining the Gold King (not far from the American Tunnel). For decades, the Gold King, like the nearby Red and Bonita mine, had not discharged any water. But not long after Sunnyside sealed its bulkheads, water started pouring out of all of them. "It was not a coincidence," says Peter Butler, ARSG co-coordinator. The backed up water had found natural fractures to follow into the other mines. Together, the Gold King and Red and Bonita would become some of the biggest polluters in the basin. Initially, their waters were run through the treatment plant that Sunnyside had left behind. But before long, Gold King ran into technical, financial and legal troubles and the treatment plant stopped operating. Water quality for miles downstream once again deteriorated. The fish that had returned to the Animas below Silverton were wiped out. Part of the renewed impetus for a Superfund designation was to bring in funds to resume water treatment as well as figure out ways to clean up the basin's remaining major polluting mines.
- **In the meantime, a piecemeal approach continues:** The ARSG, along with federal and state agencies, continue to do what they can to clean up mines. In some cases, this means plugging them, which is what the EPA is working on at the Red and Bonita, and planned to do at the Gold King, when the dam broke. Other methods include diverting water before it gets into the mine in the first place, and removing waste piles at the entrances to mines so that acidic discharge from the mine can't leech minerals out of the rock. Until the Gold King is plugged, it will continue to discharge acid mine drainage, just as it had before the spill.
- **This isn't the first time that something like this has happened, nor is it the worst:** In June of 1975, a huge tailings pile on the banks of the Animas River northeast of Silverton was breached, dumping tens of thousands of gallons of water, along with

50,000 tons of heavy-metal-loaded tailings into the Animas. For 100 miles downstream, the river "looked like aluminum paint," according to a *Durango Herald* reporter at the time; fish placed in a cage in the water in Durango all died within 24 hours. It was just one of many breaches of various magnitude. Just a decade before, the same tailings pile was found to be spilling cyanide-laced water into the river. In 1978, after the American Tunnel was bored Sunnyside Mine workings got too close to the floor of Lake Emma, the lake burst through, sending an estimated 500 million gallons of water tearing through the mines, sweeping up huge machinery, tailings and sludge, and blasting it out the American Tunnel and sending it downstream. No one was working in the mine at the time, which is either miraculous, or suspicious, depending on who you ask.



A 1975 tailings pile breach just above Silverton sullied the Animas River for 100 miles downstream, turning the water the color of 'aluminum paint' and killing fish.

- Short-term impacts aren't as bad as the water looks:** Sampling done by the EPA upstream from Durango show that the plume's peak put the Animas River's water's acidity on par with black coffee, and contained elevated levels of iron, manganese, zinc and copper. But by the time it reached town, the acidity had been diluted significantly, and levels of those metals were far lower, but still "scary," according to EPA officials. Still, the plume moved through quickly, lessening harm. A test by Colorado Parks and Wildlife, in which trout in cages were placed in the river prior to the plume's arrival, has so far shown no acute effects: Only one of 108 fish had died during the first 24 hours in contaminated water. Meanwhile, the Mountain Studies Institute has been monitoring macro-invertebrates, and their results have been similarly positive.

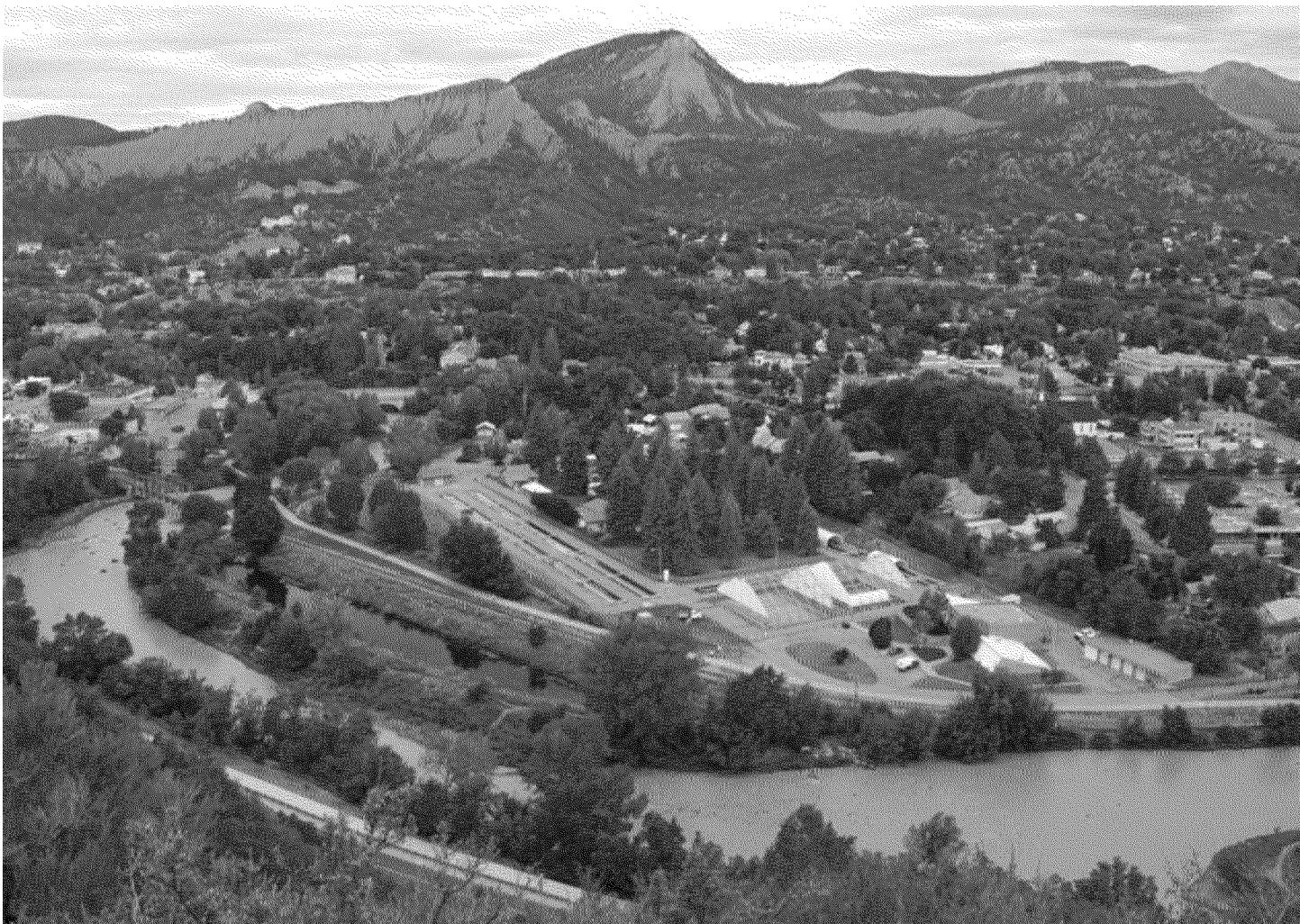


Samples taken by the EPA as the plume moved through show that it has high levels of heavy metals. Click for larger image.

[Environmental Protection Agency](#)

- **Long-term impacts are still unknown:** As the plume moved downstream, sediment settled onto the river bottom and its rocks, which could affect aquatic bugs. And it's likely to get kicked up during high water flows. If thick enough, the sediment could even affect the river's appearance, providing a Tang-colored reminder of this disaster for months to come. Also, water in some domestic wells near the river reportedly had a yellow tint in the days after the spill moved through, but it's not yet known what other contaminants may have gotten into the water. Irrigators had to shut down their ditches in hot weather, which could damage crops, and the ag economy, just as the river closure is costing rafting companies thousands of dollars each day. The plume moved through critical habitat for razorback suckers and pike minnows further downstream; they may prove more sensitive than the trout. But then, the Animas and San Juan rivers in New Mexico had their own water quality issues before the spill: alarmingly high levels of human fecal bacteria.

- **The EPA messed up, but they're not the root cause:** It's true that EPA officials took a "cavalier attitude" (EPA Region 8 administrator Shaun McGrath's word) in the first hours after the spill, downplaying the impacts and failing to notify those downstream. And they admit that before tinkering with the mine, they should have taken better steps to mitigate a possible disaster, such as drilling into the mine from the top to assess the situation without the danger of busting the dam. Had they not messed with it at all, though, the gathering water and sludge might have busted through the de facto dam sometime anyway. Clearly, the water quality issue goes far deeper than this one unfortunate event.



The contaminated Animas River as it runs through Durango. Note the contrast between the river and a fish hatchery pond next to it.

Jonathan Thompson

If initial public reaction is any indication, the disaster has woken Durangoans up not only to how important the river is, but also to what's been going on upstream. And they're likely to exert whatever pressure they can on their neighbors up in Silverton to accept, even embrace, Superfund and a comprehensive cleanup effort. They speak from experience: Durango was the site of a massive federal cleanup of a uranium tailings pile in the early 1990s, and tourism and property values did just fine. Moab, Utah, another tourism mecca, is currently in the middle of a similar cleanup. The hordes of visitors mostly seem oblivious to it. Such is not the case, however, with our Tang-hued river.

Jonathan Thompson is a senior editor of High Country News. Follow @jonnypeace



Sinjin Eberle says:

Aug 10, 2015 07:04 AM

This is a great article, JT - very comprehensive and balanced. Hopefully now the citizens and river professionals in the region will have the impetus and support to drive real change for the benefit of the river, and the long term economic sustainability of Durango (AND SILVERTON).



Karen & George Chapman says:

Aug 10, 2015 08:17 AM

Good Jonathan. I fear this whole thing may have the wrong effect-making those on the right even more suspicious of any governmental program.
By the way, the Lake Emma thing was not directly related to "boring the American Tunnel".



Jonathan Thompson says:

Aug 10, 2015 09:01 AM

Thanks, George. How would you word the Lake Emma thing? How about: the Sunnyside mine workings got too close to the bottom of Lake Emma?



Paul Larmer says:

Aug 10, 2015 09:12 AM

Jonathan - Thanks for the overview. I believe I read in another article that quite a lot of this orange sludge is still pouring out of the source, and into Cement Creek, can you confirm this? Also, prior to this big event, was there a smaller constant flow from the mine?



Paul Larmer says:

Aug 10, 2015 09:14 AM

Actually, the above comment is coming from Lisa Cook, not Paul Larmer.



Karen & George Chapman says:

Aug 10, 2015 09:20 AM

Yes, Jonathan, that would be more accurate.



Jonathan Thompson says:

Aug 10, 2015 09:21 AM

Lisa: It's complicated, to put it mildly. For many years the Gold King didn't discharge any water. But after the nearby American Tunnel was plugged as part of cleanup efforts, the water backed up in the Sunnyside mine, then followed natural fracture systems to the Gold King, which started discharging contaminated water in about 2005 and has continued to discharge. It was this water that got backed up behind the collapsed roof of the mine tunnel, and that then burst out -- "spooge," or sludge, and all -- when the EPA was tinkering with it. Now it's back to the same discharge as before it got "dammed" up by the debris, but with more of the spooge that had built up. The EPA is now running this water through impromptu ponds to settle out the spooge. I hope that makes sense.



Devon Horntvedt says:

Aug 10, 2015 10:38 AM

Solid job Jonathan... a few things...

Collapsed ceiling debris? The EPA flat out said they caused the backwater/mine pool... it seems to me they dammed the water up for 10 months during one of our highest late water groundwater years in history, guessed they "only" had 5 feet of water behind their dirt, unconsolidated fill plug... only to find out they had 12+ feet of water behind it.

"Upon suspending work last year, the (EPA) backfilled the portal to the mine. While the USEPA was removing the backfill from the portal to the Gold King Mine to continue its

investigation this year, the plug blew out releasing contaminated water behind the backfill into the Animas River," said Nancy Agro, the company's attorney in the statement."

<http://www.durangoherald.com/.../Plans-to-plug-the-Gold-King-backfire->

This isn't wastewater. It's acid rock/mine drainage. I wish everyone would stop calling it wastewater... it's not a waste from an industrial process. It seems in most articles that is giving people the wrong idea... that it's associated with tailing or somesuch.

Why do you give a free pass to the bulkheads on the Red and Bonita and Gold King after identifying why the bulkhead strategy failed so miserably at the American Tunnel? (Increased flows out of higher portals, worsening WQ in Cement Creek/Animas.)



Jonathan Thompson says:

Aug 10, 2015 11:10 AM

Devon: Thanks for the informed comments. I wondered whether the debris had been deliberately put there as a makeshift sort of plug, too, but EPA officials, as well as someone from the Animas River Stakeholders Group, told me that the "dam" was debris from a collapsed ceiling. It appears that San Juan Corp. disagrees. Perhaps we'll hear more on that as things settle out, so to speak.

You're right: Acid mine drainage is the best term for what's coming out of the mine. In this case, it's also mixed with what folks in the mine cleanup business apparently call "spooge." But that's not the same as tailings or waste, for sure. So thanks for pointing that out.

Bulkheads: Sometimes they work. Sometimes they don't. They serve more than one purpose: 1. Is to actually stop the discharge; 2. Change the chemistry in the mine (when water backs up, it pushes out the oxygen, so less likely to have acidic reaction); 3. They can be used simply to control the flow from the mine, to make it easier to pipe into a water treatment facility. The ARSG has had success with one at the Kohler mine up near Red Mountain Pass, which they sealed off and has yet to leak somewhere else after 12 years.

And as for the settling ponds, yes, the EPA is apparently using a flocculant to force the settling of the spooge; EPA officials say the water is now clear as it goes into Cement Creek.



Devon Horntvedt says:

Aug 10, 2015 10:39 AM

Also, are they only using the lagoons down there below the red and bonita to "settle" the water?

They're not using any active amendments/chemical treatment like lime to get the dissolved metals to precipitate as much as possible before entering Cement Creek??



Devon Horntvedt says:

Aug 10, 2015 11:33 AM

Hmm... just floc? That disturbs me. The Gold King historically runs 2.5-3 pH.... at that level, most of your metals are still in dissolved form. If they're only floccing that means they're not getting the pH adjustment and are only dropping out whatever has already oxidized and precipitated out... the rest of the dissolved iron is still making it's way down until the pH climbs to 5+ (ie, in the Animas) and then precipitating out there.

Many of the worst portal drains in the area run clear because the pH is so low all the metals are dissolved. The EPA should be adding lime to their first basin... I'm sure they're worried about creating too much sludge and filling up their settling ponds, but to combat that they should be pumping their water through Geotubes to remove the sludges as they form... otherwise everything they're letting go by is just precipitating out in the Animas.

As far as bulkheads

- 1) Right... hold back the discharge.
- 2) Yes, this is known as 'inundation.' The problem with inundation in large mine complexes is that you can almost never stop all the oxygen from getting in via disparate meteoric sources and other open portals that allow atmospheric oxygen in. Even if you do stop the oxygen from getting in, the pyritic oxidation cycle can still generate metals acidity via various ferroxidans bacteria.
- 3) This is the best use of bulkheads. Basically you use the mine capacity as a surge equilibration basin to make sure you don't overwhelm your treatment processes due to surging snowmelt flows etc

There are more examples of bulkheads causing more problems than success stories... American tunnel, Argo (clear creek) tunnel, Dinero (leadville)

Heck, even the gold king blowout right here is a solid example... they drastically underestimated the water that built up there in just 10 months since the last time they were in it! Imagine a few years... all that has to happen is that billion gallons finds a collapsed stope up in the workings and comes blasting out of the side of the mountain.



Jonathan Thompson says:

Aug 10, 2015 11:52 AM

Devon: Sorry, I neglected to mention that the EPA is also using caustic soda in the lagoons to get the metals out of solution. Here's their website with info:
http://epaosc.org/site/site_profile.aspx?site_id=11082



Devon Horntvedt says:

Aug 10, 2015 11:41 AM

Also, 'spooge' and amd are essentially one and the same... they're not 'mixing.' The spooge is just iron and alumin (hydr)oxides that have managed to precipitate out of solution from the dissolved state.



Devon Horntvedt says:

Aug 10, 2015 11:46 AM

I wonder if we're not seeing more crap coming from the Hero and Red Mtn adits just on the other side of the pass due to the Koehler bulkhead. No way to tell, I suppose.



Devon Horntvedt says:

Aug 10, 2015 11:54 AM

Excellent. Thanks for the updates and that link! Exactly what I've been searching for!



Devon Horntvedt says:

Aug 10, 2015 11:59 AM

This might be informative for your readers..

<https://twitter.com/TrevorHughes/status/630758159804575744>

Looks like they may still need to take my rec about pumping through geotubes to re-up their settling pond capacity....



Patrick Swonger says:

Aug 10, 2015 11:59 AM

In recently serving eight years on the town council in Silverton, we repeatedly asked our federal politicians for help in dealing with mine clean up. One of the most needed pieces of federal legislation is a Good Samaritan Act for abandoned mine sites that would allow individuals, companies and organizations to initiate clean up efforts without assuming all of the historical liability for the past. Lacking this simple legal tool, most of these sites are blocked up, left festering and are environmental time bombs waiting to release into our watersheds. This accident was inevitable based on a federal "head in the sand" approach to site remediation that is Superfund or nothing in approach. There are plenty of other "time bombs" in the San Juan's and across the West where untreated water is accumulating and waiting for catastrophic release. Hopefully some legislative help will finally come that allows a range of responses and mitigation for old mining sites - before we witness another environmental catastrophe of this scale or even larger.



Nikki Tucker says:

Aug 11, 2015 09:55 AM

Fantastic article, thank you Jonathan!

Having said that, the real reason I created an account here today to comment, is to say thank you to all of the commenters for providing such intelligent, respectful, and fact-filled commentary that only adds more beneficial information and backing to the original article! Well done. :)



Larry N Smith says:

Aug 11, 2015 01:25 PM

All, Fantastic article and knowledgeable comments - this is the best source of information I've seen. One point (made above) the coloration of the AMD seems to be a

big issue in the national coverage. I haven't seen it explained elsewhere, that it's likely due to precipitation of iron and alumina (and manganese?) hydroxides as the pH increases. I assume there's a lot of suspended sediment in the sponge too, but the color, while scary, is not the big problem with this discharge. While the fine particulates could be bad for some species (I'm a geologist, not a biologist), it sure makes for dramatic graphics. I just wish this was dealt with more in the press.

Does anyone know whether the Ug/l measurements in the graph above were for filtered or unfiltered samples?



Jonathan Thompson says:

Aug 11, 2015 01:31 PM

Larry: Great points. Unfortunately, the data that the EPA has made available to the public lacks much in the way of context or explanation, so no clue on whether it was filtered or unfiltered samples. But you might be able to figure it out by looking at the data, itself, here: http://epaosc.org/site/site_profile.aspx?site_id=11082

And you can also find historical data for those same sites here:

<http://www.animasriverstakeholdersgroup.org/page11.html>

I hope that helps.



Chris Poitras says:

Aug 11, 2015 02:35 PM

JT,

Thank you! Very informative and well written article! Thanks to all the readers for the supporting comments. I am officially informed.....



Rex Johnson Jr says:

Aug 11, 2015 02:47 PM

Stop the Pebble Mine.



Larry N Smith says:

Aug 11, 2015 02:57 PM

Jonathan,

Thanks for the link to EPA. From that site they said "Note: Total metals analysis for water samples includes the metals content both dissolved in the water and present in the particulates in the water. Typically a dissolved metals analysis of a water sample is performed by removing the particulates with a filter, then analyzing the filtered water for metals" - So apparently (as of 8/9/15) they've been reporting data from unfiltered samples. In my knowledge, the important values for fish are dissolved copper and zinc (they have lower tolerances for these metals than humans). Typically much of those metals are bound in the particulates at moderate pH values. The metals concentrations do not seem excessive, and the dissolved values may be much lower than shown on the graph. But, then again, I'm swayed by living in Butte, Montana, where we've seen surface water concentrations a few orders of magnitude higher (but in much smaller rivers).



Devon Horntvedt says:

Aug 11, 2015 04:21 PM

Larry, there's usually very little TSS in these waters until the pH gets high enough to force the oxidation/precipitation. This is because the pH is so low (I believe the gold king hangs out in the 2.5-3.0 range, although I haven't been able to get that verified. Just personal memory from ARSG meetings) that the dissolved metals stay in solution... the worst portals are actually the ones that run crystal clear. This part of my protest against the Red and Bonita bulkhead... the fact that it looks so nasty is a GOOD thing! If the metals are dropping out at the mouth of the portal, that means they aren't dropping out in the river. (Sorry, I digress.)

The link Jon put up has the preliminary data over on the sidebar
[http://epaosc.org/\[...\]/PreliminaryData_08092015.pdf](http://epaosc.org/[...]/PreliminaryData_08092015.pdf)

This has dissolved (Filtered) metals and total recoverable (unfiltered) metal results. I haven't yet found a map that explains the sample ID locations but you can get a general idea just with the names. Everyone should keep in mind the dissolved component is a PART of total recoverable when looking at that data... for example, if you see 100 mg/L dissolved and 100 mg/L total recoverable, that means all the metals are in the dissolved fraction (invisible to the naked eye.) If it's 5 mg/L dissolved and 100 mg/L total recoverable, then 95% of the metal in question is in a solid form... likely complexed with oxygen or hydroxide to form the orange metal precipitates you see (which is the way the water goes about healing itself.)

The one that really jumps out to me is 12000 ug/L of dissolved aluminum (amongst

others) at A72. Aluminum is highly toxic to aquatic life in dissolved form... the typical killing threshold being 500 ug/L (.5 mg/L)

I do wish the EPA would update the damn results table... all they have is 8/5 and 8/6 on there still... and make the map with the locations easier to find....



Kevin Grunewald says:

Aug 11, 2015 03:10 PM

On a related note, this whole situation brings to mind the recent supreme court decision striking down a 2012 EPA rule placing new restrictions on power plant emissions. The ruling indicated that the Clean Air Act required that the cost of regulations must be considered in determining if the regulation is legal. Even though the ruling may be seen as a setback for the cleanup of industrial pollution, some view this as an "open door" for the EPA to establish that the costs of not regulating power plant pollution far outweigh the immediate costs to industry and consumers, especially in the long term.
I think that's what we see clearly in the case of the Animas river waste spill - the long term. What we trade for short term gain may truly plague our grandchildren.



Fred Lowe says:

Aug 11, 2015 04:28 PM

I came to Durango two years ago to fish the local rivers for trout. It was a great trip and 8 of us Easterners spent a considerable sum in the area. This tragedy affects and saddens us from afar.

We hope that the lesson from this spill will be learned in other western states and In Alaska where new mines threaten rivers. The PR from the mining companies is- spills will never happen any more with improved techniques and technology. NONSENSE! Mines will inevitably cause environmental damage. The residents of Montana face a campaign to build a copper mine on the headwaters of the beloved Smith River. How much copper is worth the threat to this national treasure. Wake up folks- there is no such thing as a safe mine waste water containment or treatment program.

We hope the Animas and other local streams can recover quickly so we can again come to the area to fish.

Fred. NYC



Devon Horntvedt says:

Aug 11, 2015 04:32 PM

You know, there's a very good argument to be made that if the mining were still actively happening, they'd be draining these mine tunnels so that they could work in them, and there wouldn't be any water quality issues.

It's because they're abandoned and filling with groundwater that we get the problems.

Just playing a little devil's advocate here.



Judd Sundine says:

Aug 11, 2015 05:00 PM

There are technologies that are an alternative to lime softening that, if a pH of 4 or above can be achieved, the metals can be precipitated out as an oxide form (making them non-hazardous) and the suspended solids can be made to settle faster while still not using lime addition. I can send published papers if there might be an interest.



Devon Horntvedt says:

Aug 11, 2015 05:02 PM

I'm certainly interested. We could easily get to pH 4 via a beautiful limestone hanging gardens style waterfall cascade. I've been doing AMD research for almost a decade now, and every new passive tech that exists I want to KNOW about!

Who do we send our consulting bill to? ;)



Nancy Barlow says:

Aug 11, 2015 05:14 PM

Great article and very informative comments! The mainstream media doesn't seem to have a clue or want to dig deeper. Yes, everyone seems to be fixated on the color of the water. Thanks to all!



Crista Worthy says:

Aug 11, 2015 07:44 PM

Wonderful article, thank you. I hope this puts the final nail in the coffin of the Pebble Mine, where untold millions of tons of toxic waste would be perched directly above the world's greatest salmon fishery. Several other mines are proposed above the headwaters of major salmon rivers in British Columbia, as well. In 1997 I took the steam train from Durango to Silverton and noticed the Animas River seemed unnaturally blue, and, to me, dead-looking, even though it was pretty. And all the rocks along the banks, all the way up from Durango to Silverton, had a line of orange-yellow along the water line, same color as this plume that came through. I remember thinking to myself, "I am not going in that water, nor do I wish to drink it--the mines have contaminated this river." Other than human-caused extinction of species, nothing gets me more angry than greedy and/or stupid humans contaminating the planet. I am amazed we give them that right. We even allow active mining in federally-designated Wilderness Areas--yes! Right now huge equipment, backhoes, trucks, drill pads, miles of roads, taking of water, all this is going on in the Frank Church River of No Return Wilderness Area, because of a pre-wilderness-designation mining claim that the Payette National Forest Supervisor had to allow.



Rex Johnson Jr says:

Aug 11, 2015 08:14 PM

Cement Creek = Bristol Bay



Virginia Moran says:

Aug 11, 2015 10:31 PM

e



Virginia Arthur says:

Aug 11, 2015 10:42 PM

It's a bit sickening to read/hear the almost gleeful comments that everything will be just nifty! This was and is a major fck up and shows unbelievable incompetence on the part the EPA (also were these people CONTRACTORS? Would someone please report on the involvement of contractors in this? Then again, may be it would have gone better and can you imagine if contractors did this? How the EPA would respond?).

The other absurdity is the comments that "this happened before and gosh, everything just worked out fine!" Yea, parts of the Amazon have been logged over and over too and look, it grew back in! (WITH WHAT?) What this means is this already beat up watershed has been slammed over and over and over again never getting the chance to fully recover. The comments that this is happened before and everybody just have a beer and forget about it are disgusting. Those of your spouting out this rap, who are you apologizing/making excuses for? Do tell.



Devon Horntvedt says:

Aug 12, 2015 09:06 AM

Where exactly are you seeing everyone say it's fine and dandy? Or that everyone should forget about it? I've reread the entire thread a couple times, and I see none of that.

I'm also very curious about the contractor/consultants being used by the EPA, although the buck stops with those implementing the work plans (was there even a work plan?) I haven't heard anything about them yet... it seems the EPA is working hard to take the fall and protect their contractors.



William Petersen says:

Aug 12, 2015 11:00 AM

Jonathan...I just wanted to say that this is a great article and I've been linking to it on other websites because it helps to dispel some of the misinformation and lack of information out there. People need to understand the complicated history involved with the Animas, Silverton and really, the legacy issues that the West faces with these abandoned mining sites, tailing piles and holding ponds.

Maybe Silverton needs to re-examine Superfund status - at least to get the dedicated funding for clean-up, reclamation and long-term monitoring and use the Animas River

Stakeholders Group as the prime coordination organization for clean-up.